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# **Aerospace Workforce Development: The Nebraska Proposal; and Native Connections: A Multi-Consortium Workforce Development Proposal**

**Brent Bowen  
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November 2004

**UNO  
Aviation Institute  
University of Nebraska at Omaha  
Omaha, NE 68182-0508**

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**Aerospace Workforce  
Development  
Augmentation Competition**

**Submitted by the Board of Regents,  
University of Nebraska at Omaha**



**“To inspire the next generation of  
explorers... as only NASA can.”  
- NASA Mission**

*Brent D. Bowen*

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## CONSORTIUM CONCURRENCE

The academic affiliate members of the NASA Nebraska Space Grant Consortium agree with the contents of this proposal. All of the following Campus Coordinators have reviewed, contributed to, and endorsed this proposal:

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**Little Priest Tribal College**



## **Project Description**

The NASA Nebraska Space Grant Consortium (NSGC) delivers highly-skilled graduates in the science, technology, engineering and mathematics (STEM) competencies to the NASA-related career pipeline. NSGC's 2002 and 2003 Nebraska Aerospace Workforce Development Projects forged *higher education*, industry and community partnerships together with customer-focused workforce training that significantly impacted the workforce in the STEM expertise that NASA most requires. NSGC proposes to meet the steadily increasing demand for STEM content skills and to safeguard minority representation in these disciplines with a broad range of workforce development activities targeting NASA's need to strengthen connections with the *higher education*, industry and community organization sectors. This proposal fortifies NASA's Vision for Space Exploration<sup>1</sup>, by partnering with the best in the aerospace industry to inspire our youth to enter the technical fields that NASA needs most.

### ***1. Geospatial Extension, Outreach & Education***

Nebraska's strategic use of NASA and state funding in the past 13 years has established significant capacity to intensify geospatial research, education and outreach efforts. NSGC includes partnerships with Land Grant; Cooperative Extension; the University of Nebraska at Lincoln's (UNL) Center for Advanced Land Management Information Technologies (CALMIT); and remote sensing faculty at Creighton and University of Nebraska at Omaha (UNO). Also included are collaborations with the Minnesota Sea Grant, the Nebraska GIS Steering Committee, the Nebraska GIS/LIS Association, the Upper Midwest Chapter of the American Society for Photogrammetry and Remote Sensing (ASPRS) and numerous geospatial industry and governmental partners. NASA 2002 funding permitted NSGC to hire Geospatial Extension Specialist (GES) Vlasek to focus on Native American communities in Nebraska and has developed linkages between academic programs and commercial entities to contribute to both economic and workforce development for Nebraska. The GES has successfully fostered collaborative ties between CALMIT and the tribal communities; produced a Grant Writing Course for GIS Professionals; and presented research efforts at the Nebraska Academy of Sciences, Aeronautics and Space Science Section, as well as the 2003 Nebraska GIS Symposium. Year 2 extended the scope and content to include Cooperative Extension's Metro Extension Planning Unit agents in Douglas, Lancaster, and Sarpy counties, to serve the highest population of Nebraska farms and urban areas.

### **Metrics for Outcome 1.1: Global Learning & Observations to Benefit the Environment**

Currently, Nebraska is the only state in the United States that does not participate with the GLOBE program, although over one million students, 14,000 schools, and 24,000 trained GLOBE teachers throughout 100 countries take part in GLOBE. NSGC has received numerous inquiries from teachers who would like to participate in such scientific research. Dr. Jeffrey Peake, a UNO Geography professor, has offered to become a GLOBE Partner for the state of Nebraska and help facilitate teacher training. GES Vlasek, a former student of Dr. Peake, has agreed to partner to launch the GLOBE program in Nebraska. In addition, Native IMAGE (Institute for Managing Applications in Geospatial Extension) Director Jan Bingen also will help coordinate GLOBE with tribal schools in Nebraska, and has already been in contact with schools in tribal communities about the project. Students need a computer with Internet access to enter the collected data and share this information with other students, teachers, and scientists. NSGC proposes to facilitate the training, costs of the protocols, and computer facilities where necessary. A goal is set for Nebraska's first year of GLOBE participation for 16 schools (including many tribal schools), reaching 250 teachers and students statewide.

GLOBE is a hands-on learning program allowing teachers to help elementary and high school students collect data about the Earth pertaining to atmosphere, hydrology, soils, and land cover/phenology and share this information with scientists. They record their findings via an internet site where they are able to create maps and graphs for no cost. This data can then be

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<sup>1</sup> The Vision for Space Exploration; [http://www.nasa.gov/missions/solarsystem/explore\\_main.html](http://www.nasa.gov/missions/solarsystem/explore_main.html)

used in scientific research to help improve their understanding of the earth's processes. GLOBE provides training for teachers to help their students improve their achievement in STEM disciplines.

#### **Metrics for Outcome 1.2: Community Internship Program**

The NSGC Community Internship Program places interns with not-for-profit and government partners (Nebraska Dept. of Aeronautics Engineering Division, Strategic Air & Space Museum, Omaha Police Dept. Air Support Unit, and Nebraska State Patrol Air Wing). Interns receive small NSGC stipends. Not limited to the Nebraska area, over the past 4 years students and faculty members have experienced Space Grant-funded internship opportunities at NASA JPL, KSC, and LaRC. This proposal places more individuals each year by partnering with Undergraduate Student Research Program, Graduate Student Researchers Program, NASA Faculty Fellowship Program, NASA Langley Aerospace Research Summer Scholars Program, and AVSTO student competition internship programs. A goal is set to support 20 student/faculty pairings throughout the year, and 1 student placement at a NASA center.

#### **Metrics for Outcome 1.3: Native Schools Science Fair**

The Native Schools Science Fair showcases hands-on experiences for elementary, middle, and high school students, as well as student employment opportunities in the science fields. The annual fair brings together all of Nebraska's Native American schools including Winnebago, Santee, Walthill, and Macy. GES Vlasek served as a judge for the past two years and recruited other Space Grant personnel as judges. In 2003, student teachers from the UNO College of Education helped with the event. Many of the teachers are involved with the highly successful Family Science Night Program. In the second quarter NSGC proposes to sustain the Annual Native Schools Fair by providing 10 judges and support for 300 students from 10 schools.

#### **Metrics for Outcome 1.4: NE Geospatial Extension Program**

Nebraska was one of 3 states awarded funding from the USDA to support their existing GES Programs. Workforce funding is vital to the success and continued expansions of the Nebraska Geospatial Extension Program (NGEP). GES Vlasek has been instrumental in organizing 2 National GES Meetings in 2004. The meetings were sponsored by NSGC and were held in April and September 2004. In addition, a national poster was created, 4 GES panel presentations were given at National Meetings, several teleconferences were conducted, and the GES list-serve fostered collaborative opportunities for the group. Additional collaborations among the state GES' are planned including a national GES website, regional training opportunities, resource sharing, and numerous national meeting presentations.

GES Vlasek is also slated to continue working with the 13 fellow GES' across the United States (AZ, UT, MS, AL, ND, TX, MO, RI, CT, NH, VA, OK, OH) to share training materials and data, organize regional training, and present at national meetings. This work will provide training to Cooperative Extension Agents and tribal communities in Nebraska, affecting over 200 people. A goal is set for second quarter to offer training to 100 of Nebraska's County Extension Agents, spanning 93 counties. At least 2 workshops will be offered in response to County Agent requests for GPS training. These agents are expected to train other agents, children, teachers and community members, impacting hundreds of Nebraskans.

The new Geospatial Data Centers at Little Priest Tribal College (LTPC) in Winnebago, Nebraska Indian Community College (NICC) in Santee, and in the NASA Resource Center on the UNO campus provide computer workstations with GIS and remote sensing software to students, faculty and community members. Data centers at Northeast Community College in Norfolk, NE, and Iowa Western Community College (IWCC) in Council Bluffs, IA, are under development. IWCC is a collaborative effort with the Iowa Space Grant Consortium, serving the greater Omaha area. Hardware and geospatial software at these data centers allow users to access technologies such as GIS and remote sensing. Continued funding of the Geospatial Data Centers will bridge the gap for users who otherwise would not have access to this type of software. GES Vlasek conducts training workshops with these communities, preparing them to utilize the workstations.

UNO, the NSGC Lead Institution, has exclusive license to distribute and maintain DataSlate, winner of the 2001 Educational Software of the Year Award at JPL. Nebraska Geospatial Extension Program (NGEP) collaborated with JPL, UNO, and UNL to create this CD-ROM for teachers to use in the classroom to teach the basics of remote sensing, GIS, and GPS. The CD is a product of the Consortium for the Application of Space Data to Education (CASDE), whose goal is to utilize NASA's immense amount of data technology to stimulate and challenge K-12 in STEM areas. The CD has been approved for free distribution through the University of Nebraska and NASA NSGC and EPSCoR. Educators responded overwhelmingly to the distribution announcement for DataSlate, with 10,000 CD's distributed to date and another 10,000 targeted for next year. Ultimately 200,000 are projected for free distribution. Workforce development funding will enable NSGC to sustain free distribution of DataSlate, as well as develop new lesson plans.

NASA recently accepted UNO as one of 20 universities across the country to help deliver 3 online courses from the Earth System Sciences Education Alliance. These inquiry-based courses are offered for both graduate and undergraduate credit by UNO. UNO has already worked with more than 80 students in these Internet delivered courses that target K-4, 5-8 and 9-12. UNO and other project members work closely with coordinators of these national courses, including Jim Botti, in the NASA Classroom of the Future program, and Claudia Dauksys of the Institute for Global Environmental Studies. Collaborative efforts continue with Goddard Space Flight Center (GSFC) and educational specialists such as Nora Farrell.

NSGC collaborates with California Space Grant Consortium on an NES outreach called "Aeronautics in America: Our Children's Vision of the Future." NSGC provides the curriculum and web development for this project that develops posters and educational activities for K-12 classrooms, linking students with online mentors and other resource materials.

#### **Metrics for Outcome 1.5: Family Science Program**

Local educational seminars, classes, and workshops disseminate the geospatial application deliverables into Nebraska's tribal communities. Continuing community development efforts educate the customer base and members of the community-at-large regarding the use of GIS, GPS, and remote sensing, creating hands-on technology experiences for future users, including diverse students at community schools. The highly successful Family Aeronautical Science Program expanded to include geospatial activities in 2003-2004. These activities continue as the program enters Phase II of the curriculum. NGEP is partnering with several reservation teachers on lesson plans for Phase II, including GIS and remote sensing concepts and applications. Participation goal is set for 500 students, parents, teachers, community members and Space Grant staff. Four tribal schools have committed to the program (Santee, Walthill, Winnebago and Macy), with potential interest in adding a fifth school. GES Vlasek is on the Nebraska 4-H Geospatial Curriculum Committee to design curriculum for 4-H clubs and classrooms. The committee modeled its curriculum on NSGC's Family Science Night program. The goal of this three-phased curriculum (GPS - GIS - Remote Sensing) is nationwide distribution for use in 4-H clubs and school enrichment classrooms to teach youth geospatial technologies. Distribution is set for Quarter 2, reaching 500 people the first year.

#### **2. Curriculum Development & Tribal College Support**

The diversity component of this proposal maximizes the extraordinary reputation NSGC has built by delivering geospatial science experiences to Nebraska's Native Americans. For 7 years, NSGC has sustained partnerships with the 2 tribal colleges and 4 reservation school districts in Nebraska to foster aeronautics education and outreach. This program, the Nebraska Native American Outreach Program (NNAOP), has grown beyond educational institutions to become a partnership among tribal community leaders, academia, tribal schools, and industry. The content focus has broadened from aeronautics in the school systems to aerospace technology and earth science applications in tribal community decision-making and workforce training on the reservations. To date, participants include faculty and staff at 4 Nebraska tribal schools, 2 tribal colleges, approximately 1,000 Native American youth, and over 1,200 community members. This Native American initiative addresses Nebraska workforce development and serves as a model to others. Following a structured evaluation process, NSGC proposes to

sustain delivery of the training funded by NASA in 2002/2003 to tribal entities through partnerships linking academic programs and industry leaders.

In Quarter 2 the GES will assess tribal geospatial training needs and customize a training plan. The GES will conduct a geospatial workshop for Winnebago tribal community members, including the Winnebago Environmental Protection Office, Winnebago Land Management Department, faculty at LPTC, tribal school teachers from Winnebago, Walthill, Pender and Macy, with a goal of 20 tribal members to attend. Another geospatial workshop will be hosted for Santee Sioux tribal members (Santee Sioux Tribal Officials, faculty at Nebraska Indian Community College, and Santee tribal school teachers) in Quarter 2.

#### **Metrics for Outcome 2.1: 2+2 Relationships with 4-Year Institutions**

NSGC is expanding the number of K-16 geospatial-related educational offerings by collaborating with Blanche Meeson at GSFC and Ramona Travis at Stennis Space Center (SSC). NSGC is developing 2+2 relationships with four-year institutions (Wayne State, UNO, UNL and South Dakota State). Ultimately the STEM workforce pipeline will grow when students from LPTC and NICC transfer to a four-year institution for bachelor degrees in the geosciences. Both Meeson and Travis receive frequent briefings on the program's progress.

#### **Metrics for Outcome 2.2: On-line Geospatial Training Program**

Faculty training remains the primary customer focus. NSGC is developing the only non-credit, on-line training program in geospatial technologies offered in Nebraska. The program content is designed for individuals to complete training in data analysis, GIS and remote sensing for use in their communities. Remote sensing training in Nebraska is presently offered exclusively at universities on a for-credit basis. The non-credit training in geospatial technologies will build a stronger workforce pipeline by offering Nebraska residents a unique opportunity to develop or enhance skills on-line via the GES website. Funding for NGEF website development will provide a platform for the on-line geospatial training program.

#### **Metrics for Outcome 2.3: Little Priest Tribal College Support**

Housed at LPTC in Winnebago, NE, Native IMAGE officially began operating in January 2003, engaging Nebraska's tribal communities in geospatial outreach, training, and education. Partnering with LPTC, NSGC's GES supports and directs activities of the center. Funding for Native IMAGE sustains LPTC's undergraduate research fellows, who conduct geospatial research by incorporating workshop knowledge to archive data for broad access. LPTC faculty and staff train fellow educators, students and community members with skills acquired at summer training workshops.

Color infrared imagery collected over the Santee Sioux and Winnebago Native American Reservations continues to provide educational and economic, customer-focused opportunities for Nebraska's tribes. Hyperspectral imagery collected on the Winnebago Reservation focuses on 2 bison pastures. After Creighton and UNO collect, analyze and evaluate the data, they transfer it to Native IMAGE, who delivers the imagery, research data, and results to the Winnebago tribal council, planning department, community, and schools. Along with agricultural implications, this information impacts economic, social and cultural issues.

### **Evaluation Mechanisms**

NSGC's Lead Institution, UNO, has appointed a faculty member with a research specialty in program evaluation to engage in the growth of workforce development activities. This knowledge and expertise ensures that the quality and quantity of workforce development within the state meets all proposed outcomes: to serve its customer base; to be rich in relevant aerospace content; to guide faculty and students through the NASA pipeline; to promote diversity; and to actualize sustainable partnerships.

The Technical Advisory Committee ensures continuous quality improvement of all funded program content. Members attend semi-annual meetings and participate in additional reviews periodically throughout the year, including reporting forums from funded researchers and students in the NASA pipeline.

NSGC's updated strategic plan incorporates the views of all academic affiliates and documents their needs in the near future. After successfully completing the Space Grant program's 15-year evaluation process, Nebraska is primed to excel with a newly Designated grant status. Nebraska's 10-year evaluation from NASA cited "your assessment of areas for improvement are on target and the review team encourages you to pursue them, especially towards creating ties with aerospace-related industry." In response, NSGC is increasing its substantial efforts to create new partnerships with industry through this proposal.

**Project Relationship to NASA**

*2004 Nebraska Aerospace Workforce Development Goal/Outcome Alignment*

| Performance Indicators              | Goal I<br>Career<br>Pipeline | Goal II<br>Aerospace<br>Interests | Goal III<br>Diversity |
|-------------------------------------|------------------------------|-----------------------------------|-----------------------|
| 1.1 GLOBE                           | ○                            | ○                                 | ○                     |
| 1.2 Community Internship Program    | ○                            | ○                                 |                       |
| 1.3 Native Schools Science Fair     | ○                            | ○                                 | ○                     |
| 1.4 NE Geospatial Extension Program | ○                            | ○                                 | ○                     |
| 1.5 Family Science Program          | ○                            | ○                                 | ○                     |
| 2.1 2+2 Relationships               | ○                            | ○                                 | ○                     |
| 2.2 On-line Geospatial Training     | ○                            | ○                                 |                       |
| 2.3 LTPC Support                    | ○                            | ○                                 | ○                     |

**LEGEND:**

**Goal I:** Support *higher education* research capabilities & opportunities that attract & prepare increasing numbers of students & faculty to the NASA-related career pipeline

**Goal II:** Encourage participants to pursue areas of relevance and interest to the Aerospace community

**Goal III:** Increase the number & diversity of students, faculty & researchers from underrepresented groups & underserved communities that are involved in NASA-related STEM disciplines

This proposal aligns with the President's Human Capital priority, developing and nurturing relationships to NASA in the form of both student research and training<sup>2</sup>. It directly addresses the concerns of the President's Commission on Implementation of United State Space Exploration Policy that there are insufficient methods for students to acquire hands-on experience in the STEM disciplines<sup>3</sup>.

NASA researchers praise NNAOP for its efforts to extend science education and technology to underrepresented and underserved populations. Dr. Thomas Pinelli of NASA LaRC assisted in the vision of this program. NASA Space Grant Program Manager Julius Dasch endorsed the implementation of a Nebraska GES position. This is an important component of the national Earth Grant program initiative between USDA, NASA, and NOAA.

Several NASA Programs validated the curriculum development content (NASA Learners Initiative, America's Virtual Farm, and NASA Classroom of the Future) at the national level through a competitive selection process. NSGC staff work closely with NASA experts in this area such as Blanche Meeson (GSFC) to ensure quality produce delivery.

Nebraska's Aerospace Workforce Development project can serve as a model to other consortia or institutions. NSGC has taken full advantage of its affiliate network, forged numerous partnerships with local, state, and national organizations, and has developed the NE Geospatial Extension Program into a model program.

<sup>2</sup> NASA Human Capital Management Plan; <http://nasapeople.nasa.gov/hcm>

<sup>3</sup> President's Commission on Implementation of United States space Exploration Policy, *A Journey to Inspire, Innovate, and Discover*; [http://www.nasa.gov/pdf/60736main\\_M2M\\_report?small.pdf](http://www.nasa.gov/pdf/60736main_M2M_report?small.pdf), pg. 43.

| Outcome                             | SMART Goal        | Activity of GES Vasek & designees  | Quarter |
|-------------------------------------|-------------------|--|---------|
| 1.1 GLOBE                           |                   | Meet with NE GLOBE Coordinator Peake to outline plan   | 1       |
|                                     | 16 schools        | Meet with interested GLOBE teachers to coordinate training   | 2       |
|                                     | 50 teachers       | Organize GLOBE Training Session & order materials  | 3       |
|                                     |                   | Evaluate GLOBE progress  | 4       |
| 1.2. Community Internships          |                   | Promote GSRP, USRP, NASA Faculty Fellowship Program, Langley Aerospace Research Summer Scholars Program                          | 1       |
|                                     |                   | Outline stipend process for summer program awardees  | 2       |
|                                     | 20 students       | Student placement in NE Community Internship Program   | 2       |
|                                     | 1 student         | Student placement at a NASA center   | 3       |
|                                     | 5 partners        | Expand Community Internship Program with 5 new partners  | 1,2,3,4 |
| 1.3. Native Schools Science Fair    | 300 students      | Attend & support Native Schools Science Fair; provide 10 judges  | 2       |
| 1.4 NE Geospatial Extension Program | 250 people        | Maintain geospatial data centers   | 1,2,3,4 |
|                                     | 93 counties       | GES training to all NE County Extension Agents   | 2       |
|                                     | 93 counties       | GES continues to meet with Nebraska County Extension Agents to understand geospatial needs in Nebraska                           | 2       |
|                                     |                   | Present research outcomes at Aeronautics & Space Science Section of the Nebraska Academy of Sciences                             | 2       |
|                                     | 500 people        | 4-H Geospatial Curriculum distributed to 4-H clubs and schools' students, teachers and cooperative agents                        | 2       |
|                                     | 13 GESs           | GES collaboration with fellow GES's to share training materials & data, organize regional training, present at national meetings | 2       |
|                                     | 10,000 copies     | DataSlate CD distribution across the United States   | 1,2,3,4 |
|                                     |                   |  |         |
| 1.5. Family Science Program         | 300 people        | GES input into Geospatial Family Science Night Curriculum for 4 tribal schools' students, teachers, community members            | 1       |
| 2.1 2+2 Relationships               |                   | Development of 2+2 relationships with 4-year institutions  | 1,2,3,4 |
| 2.2 On-line Geospatial Training     |                   | Redirect the geospatial certificate program to non-credit, on-line training program on GES website                               | 2       |
|                                     |                   | Evaluate on-line geospatial training/certificate program on GES website  | 4       |
|                                     |                   | NGEP website development   | 1,2,3,4 |
| 2.3 LPTC Support                    |                   | Assess tribal geospatial training needs & customize training plan  | 2       |
|                                     | 10 tribal members | Host workshop at NICC in Santee, NE  | 2       |
|                                     | 20 tribal members | GES leads seminar on Winnebago Reservation   | 3       |
|                                     | 20 tribal members | Geospatial training workshop for Santee Sioux Tribal Officials   | 3       |
| Overall Program                     |                   | Evaluation/Validation of outcomes at Technical Advisory Committee Meeting  | 2&4     |
|                                     |                   | Continue to collaborate with NSGC consortium affiliates  | 1,2,3,4 |

# **NATIVE CONNECTIONS: A Multi-Consortium Workforce Development Proposal**

**Submitted by the Board of Regents,  
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**MULTI-CONSORTIUM CONCURRENCE**

All participating NASA Space Grant Consortium directors agree with  
and endorse the contents of this proposal:

Nebraska Space Grant  
Consortium

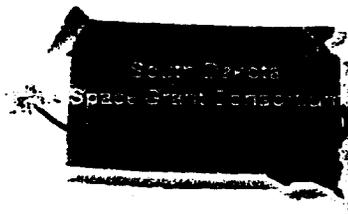


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**WYOMING**  
NASA Space Grant Consortium

**OREGON**



## **NativeConnections**

### **Project Description**

NativeConnections is a continuation of the highly successful NativeView Connections multi-consortia workforce project. Phase II eliminates the word “view” to help differentiate it from the USGS NativeView initiative (with which NativeConnections is closely aligned). This proposal engages 8 Space Grant Consortia (NE, ID, KS, OR, ND, SD, UT, WY) in a partnership with Native American *higher education institutions or higher education entities with ties to Native American tribes* to provide geospatial training. Each participating state will continue their established mentoring relationships among Space Grant program, remote sensing specialist, and tribal partner(s). NativeConnections builds upon the successes of Native IMAGE (Institute for Managing Applications in Geospatial Extension), a Nebraska Space Grant-funded center and a charter member of NativeView. NativeView is a consortium of tribal colleges/universities, industry partners, and other tribal entities working to improve geospatial applications on native lands<sup>4</sup>.

NativeConnections’ success lies in its decentralized management plan, which has enabled each state to customize and conduct training programs for delivery to the tribal partner(s) in multiple states. A decentralized management plan ensures participants the flexibility to customize mentoring plans specific to each state and tribal partner’s unique needs. The Nebraska Space Grant Consortium (NSGC) will continue to lead the multi-state partnership, guided by the precepts of the NativeView Charter. Disseminating geospatial technologies to end-users for decision-support, education, and workforce development are of high relevance to NASA. This is evident by the recent RFP jointly issued by NASA and USDA to continue to develop and expand the Geospatial Extension Specialist Program<sup>5</sup>.

### **Participating NativeConnections Space Grant Consortia**

All tribal partners are either colleges/universities or have ties to *higher education*. Kansas represents a new addition to the consortia. NSGC will continue to lead NativeConnections, providing necessary education, science, and cultural leadership with a long history of outreach to Nebraska’s Native American community in cooperative education, outreach, applications, and research activities. All eight states will be involved equally with full equity in participation. Each participating consortium will designate the following principals (listed by state):

|                 | Tribal Partners  | Designated remote sensing specialist | Space grant program director | Space grant staff point of contact |
|-----------------|--|--------------------------------------|------------------------------|------------------------------------|
| ID              | Shoshone-Paiute Tribes of the Duck Valley Indian Reservation | Dr. Nancy Glenn                      | Dr. Jean Teasdale, Director  | Ms. April Christerson, Coordinator |
| KS <sup>6</sup> | Haskell Indian Nations University                            | Mr. John Kostelnick                  | Dr. David Downing            | Dr. Richard Hale                   |
| NE              | Little Priest Tribal College and Nebraska Indian Community   | Ms. Karisa Vlasek                    | Dr. Brent Bowen, Director    | Ms. Mary Fink, Coordinator         |

<sup>4</sup> NativeView (n.d.). Retrieved October 11, 2004 from <http://www.sinte.edu/nativeview.html>

<sup>5</sup> United States Department of Agriculture (USDA) and the National Aeronautics and Space Administration (NASA). (December 2003). *Decision Support, Education, and Workforce Development Through the Geospatial Extension Specialist Program*. [RFP]. Washington, DC: Author.

<sup>6</sup> Kansas is a new participating consortia to NativeConnections Phase II.

|    |   |   |                                 |   |
|----|---|---|---------------------------------|---|
|    | College   |   |                                 |   |
| ND | Turtle Mountain Community College   | Dr. Brad Rundquist  | Dr. Shan de Silva, Director     | Ms. Suezette Bieri, Assistant Director                                    |
| OR | Southern Oregon University (Klamath Tribe)                                      | Dr. Peter Wu  | Dr. Jack Higginbotham, Director | Ms. Catherine Lanier, Assistant Director                                  |
| SD | Oglala Lakota College<br>Sinte Gleska University                                | Ms. Mary O'Neill<br>Dr. Edward Duke<br>Mr. Patrick Kozak<br>Dr. Sylvio Mannel | Dr. Edward Duke, Director       | Mr. Thomas Durkin, Deputy Director  |
| UT | Students from Ute, Piute, Northwest Band of Shoshone Bannock, and Navajo Tribes | Linda Rodgers-JPL<br>Center Contact <sup>7</sup>                              | Dr. Dwayne Westenskow           | Mr. John Vanderford   |
| WY | Wind River Tribal College   | Dr. William Gribb<br>Dr. Kenneth Driese<br>Dr. Ramesh Sivanpillai             | Dr. Paul Johnson, Director      | Ms. Kristie Scheel, Associate Director<br>Dr. Kathleen Harper, Consultant |

### **NativeConnections Phase I Accomplishments & Synergy**

|    | Tribal Partners  | Set goals, indicators, metrics for each state | Needs Assessment Complete | Training Completed and/or In Progress | Evaluate progress share best practices prepare for Phase II |
|----|--|---|---------------------------|---------------------------------------|---|
| ID | Shoshone-Paiute Tribes of the Duck Valley Indian Reservation     | ●   | ●                         | ●                                     | ●   |
| NE | Little Priest Tribal College & Nebraska Indian Community College | ●   | ●                         | ●                                     | ●   |
| ND | Turtle Mountain Community College                                | ●   | ●                         | ●                                     | ●   |
| OR | Klamath Tribe  | ●   | ●                         | ●                                     | ●   |
| SD | Oglala Lakota College & Sinte Gleska University                  | ●   | ●                         | ●                                     | ●   |
| UT | Ute Tribal Education Department                                  | ●   | ●                         | ●                                     | ●   |
| WY | Wind River EPA   | ●   | ●                         | ●                                     | ●   |

### **Synergistic Outcomes From Phase I:**

Phase I delivered diverse opportunities for information dissemination amongst the consortia. The 2004 Western Region Space Grant Meeting held at the Johnson Space Center

<sup>7</sup> Linda Rodgers has been contacted by the Utah Space Grant Consortium about internships at JPL.

(JSC) facilitated poster presentations for all 7 consortia to demonstrate accomplishments of the partnerships between the tribal partners and space grants. A separate briefing was conducted with NASA Technical Monitor Dr. Kamlesh Lulla of JSC. NativeConnections also held a lunch meeting at the conference. Findings were shared in The Good, Bad, and the Ugly Presentation: Lessons Learned from the NativeConnections Project. The 2004 National Space Grant Meeting in Pasadena, CA, provided further interaction at the NativeConnections Breakfast Meeting. Two teleconferences were also held. On May 18, 2004, the teleconference topics included discussing the needs assessment, identifying remote sensing specialists for states that had yet to determine them, and creating a NativeConnections website. The October 13, 2004, teleconference addressed building next phase of NativeConnections for the 2004 Workforce Call and compiling a report of Phase I accomplishments. Phase I enhanced opportunities for sharing trainers; as a result of this interaction, Nebraska will be helping Oregon. To further facilitate communications amongst the consortia, the NativeConnections website was created (<http://nativeconnections.unomaha.edu>)

NativeConnections serves as an excellent model to other consortia and institutions. The multi-state consortia have taken full advantage of sharing geospatial resources and expertise. In addition, the sharing of best practices and lessons learned have been extremely beneficial to all partners involved. NativeConnection's best practices can be exported to other consortia. The project will continue to leverage Space Grant resources, collaborate with affiliates, utilize the Geospatial Extension Specialist network, participate in the NativeView initiative, and continue to work with local, state, and national partners.

**Goals & Objectives**

One of the major benefits of a multi-state consortia collaboration is the ability to easily share and disseminate ideas and results from each participant. For example, by using frequent teleconferences we were able to understand that accomplishing the needs assessment phase of this project was a major accomplishment due to the numerous challenges that arose. Phase II of NativeConnections will advance the current momentum and give tribal entities a lasting new resource. The next phase will sustain NativeConnections and provide for a lasting impact with our tribal partners.

Goal I: Support *higher education* research capability and opportunities that prepare increasing numbers of students for **NASA-related careers**<sup>8</sup>.

| OUTCOME  | PERFORMANCE INDICATOR  | METRICS   |
|--|--|---|
| Increased pipeline of well-prepared <i>higher education</i> graduates and faculty that stay connected or become involved with NASA as employees, contractors, or PIs | 1.1 Introduction and expansion of geospatial science-related experiences on reservations connect tribal members and students with NASA-supported technologies to understand and provide tools to help solve their environmental and social issues.<br><br>1.2 States implement remote sensing continuing education credits, training programs and workshops customized to their communities' | 1.1 Number of graduates, # & types of geospatial science related experiences<br><br>1.2 Number of C.E. units awarded; # of students matriculated: # & types of training programs & workshops; |

<sup>8</sup> National Aeronautics and Space Administration (NASA) (September 2004). *Aerospace Workforce Development Competition*. [RFP]. Washington, DC: Author.

|  |                 |                                    |
|--|-----------------|------------------------------------|
|  | workforce needs | attendance at programs & workshops |
|--|-----------------|------------------------------------|

Goal II: Encourage participants to pursue areas of relevance and interest to the aerospace community<sup>9</sup>.

| OUTCOME  | PERFORMANCE INDICATOR   | METRICS  |
|--|---|--|
| Increased number and diversity of highly qualified individuals who are knowledgeable of and experienced in NASA's research mission | 2.1 Products resulting from geospatial research information transferred to the public and corporate communities through applied research, demonstration projects, and educational programs. | 2.1 Number & types of products, # and types of applied research, demonstration projects and education programs |

Goal III: Increase the number and diversity of students, faculty, and researchers from underrepresented groups and underserved communities that are involved in NASA-related science, technology, engineering, and mathematics disciplines<sup>10</sup>.

| OUTCOME  | PERFORMANCE INDICATOR  | METRICS   |
|--|--|---|
| Increased number and diversity of highly qualified individuals who are knowledgeable of and experienced in NASA's research mission | 3.1 Partnership created among tribal colleges, state space grant programs, NASA, and designated remote sensing specialists to share geospatial information and data. | 3.1 Number & types of partnerships                        |
|  | 3.2 Applications developed for using geospatial information to support and develop Native American agriculture, resource management, and economic development.       | 3.2 Number & types of specific applications               |
|  | 3.3 Build upon Little Priest Tribal College and Native IMAGE successes to establish mentoring plans within each state.   | 3.3 Number & types of mentoring relationships established |

A study of geospatial programs at America's 35 tribal colleges was conducted in 2002, revealing what geospatial programs currently exist at these institutions<sup>11</sup>. This report serves as the touchstone for comparison of the performance indicators for NativeConnections' **evaluation**. Many of the quantitative metrics indicated above will be attainable through tribal colleges' disaggregated student counts or the principals' outreach counts. Qualitative data will be collected by surveying participants on workshop outcomes and through the request of written evaluation letters from tribal partners. A **technical monitor secured directly from NASA** will provide guidance in the **evaluation process**.

### **Project Relationship to NASA**

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

<sup>11</sup> Trimm, Jason. (2002). *Existing Geospatial Programs at American Indian Colleges*. Omaha, NE: NNSG/EPSCoR.

NASA has made it clear that minorities are vital to their mission. Our goal is to recruit Native American students in math, science, and technology who embody the potential to develop the qualifications to become NASA employees. As they work in the field with NASA or a contractor, the students will gain the knowledge in class as well as on-hands-experience, which will make them even more qualified and helpful to enhance the future of the space program. NativeConnections ties directly to NASA's workforce needs. NASA estimates that 26% of its most highly trained geotechnical staff are due to retire at the end of the next decade<sup>12</sup>. To keep the geospatial workforce strong, increases are needed in the number of graduates from 2-year and 4-year degree programs, increase the numbers of students enrolled in college-level courses, and interest in the geosciences among pre-college students<sup>13</sup>

A fellowship program between JPL and our consortia will help NASA develop a more diversified workforce as Native Americans become involved in our program. As Native Americans become employees working for or with NASA they become mentors and set examples as they encourage other minorities to achieve similar goals.

|    | Tribal Partners   | Number of Projected Participants | Estimated Number of Affected People <sup>14</sup> | Contributes to NASA Workforce via Pipeline | Diversity |
|----|---|----------------------------------|---|--|-----------|
| ID | Shoshone-Paiute Tribes of the Duck Valley Indian Reservation                    | 20                               | 100   | ●  | ●         |
| KS | Haskell Indian Nations University   | 37                               | 500   | ●  | ●         |
| NE | Little Priest Tribal College & Nebraska Indian Community College                | 75                               | 300   | ●  | ●         |
| ND | Turtle Mountain Community College   | 15                               | 250   | ●  | ●         |
| OR | Southern Oregon University (Klamath Tribe)                                      | 35                               | 200   | ●  | ●         |
| SD | Oglala Lakota College & Sinte Gleska University                                 | 150                              | 300   | ●  | ●         |
| UT | Students from Ute, Piute, Northwest Band of Shoshone Bannock, and Navajo Tribes | 3 <sup>15</sup>                  | 100   | ●  | ●         |
| WY | Wind River Tribal College   | 50                               | 250   | ●  | ●         |

**Budget: \$20,000 per state**

<sup>12</sup> Gerwin, V. (2004). Mapping opportunities. *Nature*, 427, 376-377.

<sup>13</sup> Hunton, J. (n.d.). *Geoscience education and diversity*. Retrieved October 11, 2004, from <http://www.geo.nsf.gov/geo/diversity>

<sup>14</sup> Estimates based upon participants diffusing the technology, training others, and acting as mentors

<sup>15</sup> 3 Native American students placed at a NASA Center

## NativeConnections SMART Schedule

| SMART Activity  | Quarter    |
|---|------------|
| NativeConnections Meeting and poster presentation at the National Space Grant Spring Meeting in Washington, DC  | 1          |
| Presentation of NativeConnections results at the 2005 USGS NativeView/Tribal College Forum  | 1          |
| NativeConnections Meeting and presentation at the 2005 Western Region Space Grant Meeting in Grand Forks, ND <sup>16</sup>  | 2          |
| Continue to evaluate tribal training requirements through a needs assessment  | 3          |
| Each state performs an evaluation on another state's activities to share feedback and advance the benefit of being in a multi-consortia project                           | 4          |
| Utilize NASA remote sensing imagery, data, and research for workshops   | 1, 2, 3, 4 |
| Deliver customized geospatial training workshops  | 1, 2, 3, 4 |
| Share best practices with each partnering consortia   | 1, 2, 3, 4 |
| Share and coordinate trainers for training in all NativeConnections consortia when applicable   | 1, 2, 3, 4 |
| NativeConnections teleconferences   | 1, 2, 3, 4 |
| Share training materials and data   | 1, 2, 3, 4 |
| Collaborate on regional training workshop opportunities when appropriate  | 1, 2, 3, 4 |
| Continue development and expansion of NativeConnections website <sup>17</sup>   | 1, 2, 3, 4 |
| Collaborate on the initial development of a geospatial web-based archive/atlas or CD-ROM showcasing applications of geospatial technologies on tribal lands <sup>18</sup> | 1, 2, 3, 4 |
| Continue developing extensive Native American geospatial network  | 1, 2, 3, 4 |
| Continue to involve Space Grant affiliates from NativeConnections' partnering states <sup>19</sup>  | 1, 2, 3, 4 |
| Brief NASA Technical Monitor Dr. Kamlesh Lulla at Johnson Space Center  | 1, 2, 3, 4 |
| Evaluate goals, performance indicators, and metrics   | 1, 2, 3, 4 |
| Commence strategic planning for follow-up projects in future years  | 1, 2, 3, 4 |

<sup>16</sup> Tribal representatives from each NativeConnections state will be encouraged to participate on a panel discussion at the 2005 Space Grant Western Region Meeting

<sup>17</sup> <http://nativeconnections.unomaha.edu>

<sup>18</sup> This project idea was suggested by NASA technical monitor Dr. Kamlesh Lulla at Johnson Space Center

<sup>19</sup> Little Priest Tribal College and Nebraska Indian Community College are NE Space Grant affiliates. Other NativeConnections states have indicated they would like to add their tribal organizations as affiliates if they are not participating already.